IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

INTERMEC IP CORP., a Delaware corporation,	)	
Plaintiff,	)	
v.	)	C.A. No. 04-357-GMS
SYMBOL TECHNOLOGIES, INC., a Delaware corporation,	)	
Defendant.	)	

PLAINTIFF'S OPENING CLAIM CONSTRUCTION BRIEF

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NATURE AND STAGE OF THE PROCEEDING

Plaintiff Intermec IP Corp. ("Intermec") filed this patent infringement action against Matrics, Inc. ("Matrics") on June 7, 2004. Months later, Matrics was acquired by Symbol Technologies, Inc. ("Symbol"), which, on Symbol's motion, has now been substituted as the defendant.

On February 8, 2005, this Court entered a Scheduling Order (D.I. 26) setting a trial date of May 1, 2006. The Court set a Markman hearing for September 7, 2005. On July 18, 2005, the parties submitted a joint claim chart (D.I. 67). This is Intermec's opening claim construction brief.

SUMMARY OF ARGUMENT

The claim construction issues raised by the parties can be resolved based on a plain reading of the claim language, read in light of the patent specifications and prosecution histories. Resort to extrinsic evidence is not necessary. The intrinsic evidence clearly supports Plaintiff's proposed claim constructions.[1] Plaintiff respectfully submits that the disputed claim terms should be construed as follows:

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[1] The parties agreed that opening briefs would focus on why each party believed its proposed claim constructions are correct and use the reply briefs to argue why the other party's proposed claim constructions are incorrect.

'222 Patent

The term "adjacent proximity" should be construed to mean "close (i.e., not stacked)," as stated in the specifications, where "stacked" refers to the stacking of electrical planes, not physical stacking of components.

The terms "connecting lines" should be construed as having its ordinary meaning: "any substance that connects two or more electrical components."

The term "coplanar" should be construed, as set forth in the specification, to mean "no vias, crossovers, etc., a single plane of wiring, *i.e.*, "coplanar" refers to components being in the same electrical plane, although not necessarily in the same physical or geometric plane.[2]

'632 Patent

The term "backscattered" should be construed to mean "the reflection of incoming RF energy centered about the carrier frequency."

The terms "the tag oscillator frequency determined by the RF signal sent from [or by] the base station" and "adjusting the tag oscillation frequency in response to the RF signal from the base station" should be construed to mean that the tag oscillation frequency is determined by the modulation frequency of the RF signal sent from the base station, as opposed to the carrier frequency of the RF signal sent from the base station.

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[2] The terms "vias" and "crossovers" are explained below.

"019 Patent

The term "defining a plurality of RF tags into different groups according to a physical wave characteristic of the electromagnetic wave energy released from the RF tags" and "grouping the RF tags according to a physical characteristic of their responsive electromagnetic signals" should be given their ordinary meaning where their phrases "physical wave characteristic" or "physical characteristic" is not limited to any particular wave characteristic.

The terms "reading the RF tags in each group" and "communicating with the tags in each defined group" should be given their ordinary meaning that the reader (or base station) reads or communicates with the tags in each group.

STATEMENT OF FACTS

The four patents in this case are related to Radio Frequency Identification (RFID) Technology. RFID is an identification technology used to identify objects without the necessity of having direct contact with, or visible access to, the object. Examples of the many uses of RFID include tags on windshields for entry to a toll road, implantable chips for identification of pets and cattle, and tags on goods so they can be tracked through the supply chain. An RFID system typically consists of one or more tags (also called transponders); one or more read/write devices (also called readers or base stations); and application software and a host computer system. RFID tags can be attached to virtually anything from a semi tractor, to a pallet, to a case, to an item on a store shelf. The tag can hold many types of data about the item to which it is attached, such as credit card information (for paying highway tolls), a description of a product, its

serial number, configuration instructions, when the item traveled through a certain zone, even temperature and other data provided by sensors.

Radio waves are used to transfer data between the RFID tag and the reader. The reader sends out a radio signal, which is received by any tags tuned to the reader's frequency that are present in the RF field. The tags have antennas that receive the signal, and selected tags respond by reflecting the incoming radio signal modulated by the data stored on the tags. The process of the tag reflecting the incoming reader carrier signal modulated about that signals carrier frequency is called backscatter. The reader receives the modulated tag signal with its antenna, decodes it and transfers the data to the host computer system.

The tags at issue in this case are passive tags, which means the tags do not have batteries, but instead receive all of the power necessary for their operation from the incoming RF signal. Active tags, by contrast, are powered by a battery contained on the tag.

The four patents at issue in this case are directed at different aspects of the RFID system:

I. U.S. PATENT NO. 5,528,222

U.S. Patent No. 5,528,222 (the "'222 patent") (Exh. A), which issued on June 18, 1996 from an application filed on September 9, 1994, is entitled "Radio Frequency Circuit and Memory in Thin Flexible Package." The '222 patent addresses issues related to the physical properties of the RFID tag itself. In particular, the '222 patent recognized the need for a thin flexible tag that could be used in a wide variety of

applications where the thick or inflexible tags of the prior art could not be used effectively.

To accomplish its objective, the '222 patent discloses fabricating a tag on a thin flexible substrate and laying out all the tag components, *i.e.*, the tag antenna and circuit chip, very close together in a single electrical plane. This is in contrast to the prior art tags, which did not use flexible substrates and where the different components might be mounted on different substrates *i.e.*, on different electrical planes, which would then be stacked on top of one another, requiring the use of vias and/or crossovers to connect the components. Vias are holes in a substrate that permit connecting wires to pass from one electrical plane to another. Crossovers occur where a wire is required to cross over other wires to make a necessary connection. The stacking of substrates and crossovers add thickness to the tag and reduce its flexibility. By its novel design, the '222 patent disclosed and claimed a tag that was novel in the art at the time, but which is now commonplace.

Claim 1 of the '222 patent, the only independent claim, is the only claim from this patent currently being asserted by Intermec. Claim 1 is directed to a "thin flexible" tag having, among other things, a "circuit chip," with circuitry and chip connectors, which is "in adjacent proximity to the antenna." The patent specification defines "adjacent proximity" to mean "close (i.e. not stacked)," where stacking refers to the stacking of planes of electrical wiring. ('222 patent, Col. 3, lns. 15-19; Fig. 2) (Ex. A). The parties dispute the proper interpretation of "adjacent proximity."

The claim also calls for the circuit chip to have "one or more connecting lines between the antenna terminals and the chip connectors" where the connecting lines are "coplanar with the antenna and antenna terminals." The "connecting lines" simply provide the electrical connection between the chip connectors and the antenna and are "coplanar" with the antenna meaning that they are in the same *electrical* plane. The parties dispute the proper interpretation of "connecting lines" and "coplanar."

II. U.S. PATENT NO. 5,912,632

U.S. Patent No. 5,912,632 (the "'632 patent") (Ex. B), which issued on June 15, 1999 from an application filed on January 8, 1997, is entitled "Single Chip RF Tag Oscillator Circuit Synchronized by Base Station Modulation Frequency." The '632 patent addresses a key aspect of the interaction between the reader (or base station) and the RFID tag. As noted above, an RFID tag communicates its stored information by modulating that information onto a reflection of the RF carrier signal transmitted by the RFID reader (or base station). The RFID tag circuitry includes, among other things, a logic section, a memory and an oscillator. The oscillator is used both to provide clocking signals to the logic section and to generate the modulation frequencies necessary to modulate the RF signal reflected by the tag.

Prior art tags used a separate and expensive local fixed frequency source to fix the tag oscillation frequency. This frequency source was not only expensive, but required a lot of power and was difficult to integrate onto the RFID tag. To solve this problem, the '632 patent disclosed and claimed a novel RFID tag where the tag oscillation frequency was determined by the modulation frequency of the RF signal sent

by the reader, obviating any need for a local fixed frequency source. The result was the smaller, less expensive tag with better range in use today.[3]

Independent claims 1, 13, 22 and 28 are currently being asserted by Intermec. Claims 1 and 28 are directed to "A passive radio frequency (RF) transponder (tag)," while claims 13 and 22 are directed to "A method of setting a tag oscillation frequency of a tag oscillator of a passive RF tag . . . ." and "A system for sending and receiving modulated RF signals," respectively. Although the four claims use different language to describe the claimed invention, each of the claims includes limitations directed at similar concepts. As a result, the claim construction issues are essentially the same with respect to each claim and can, therefore, be addressed together.

Each of the claims, for example, includes a limitation similar to the following from claim 1:

> the tag oscillator frequency used to determine a tag modulation frequency of an RF signal backscattered from the tag antenna,

parties dispute the proper interpretation of "backscattered."

Each of the asserted claims also includes a limitation similar to the following from claim 1:

> the tag oscillation frequency determined by the RF signal sent from the base station.

The parties also dispute the proper interpretation of this claim limitation.

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[3] A tag's range, *i.e.*, the distance at which it can be read, is inversely proportional to the amount of power consumed by the tag.

III. U.S. PATENT NO. 5,995,019

U.S. Patent No. 5,995,019 (the "'019 patent") (Ex. C), which issued on November 30, 1999 as a continuation of an application filed on September 30, 1996, is entitled "Method for Communicating with RF Transponders." The '019 patent addresses the situation where an RFID reader (or base station) needs to communicate with a number of different tags within the field of its RF signal. This might occur, for example, in a warehouse situation where an operator wants to identify the items in a particular part of the warehouse or the items on a pallet as it passes near a stationary reader.

An RFID tag communicates its stored information to the reader by reflecting the reader's RF signal and modulating onto that reflected signal data based on the data from its memory. The RFID reader can only read data from one RFID tag at a time, so, if multiple tags are present within the field of the reader's RF signal, a mechanism is required to select the individual tags in a systematic way, so that each tag is read in turn. The efficiency of this mechanism will dictate how quickly the reader can read a large number of tags.

The '019 patent discloses and claims a method for reading multiple RFID tags by first grouping the tags based on a physical property of the RF signal received by the reader from the tag, for example, the RF signal's modulation frequency. As the tags are grouped, the tags of one group are temporarily shut down or put in a mute state so they no longer respond to the reader while the tags in the other group are divided into smaller groups. The grouping continues until a group contains only one tag, at which point that tag is read. After a tag is read, it is shut down, and the grouping process starts

over and is repeated for all the other tags until all of the tags have been read. By grouping the tags, the invention of the '019 patent enables more tags to be read more quickly than by prior art methods.

Independent claims 1, 9 and 18, as well as dependent claims 3, 11 and 16, are currently being asserted by Intermec. Claim 1 is directed at "A method for communicating between a base station and a set of radio frequency RF transponders (Tags)," while independent claims 9 and 18 are directed to "An RF tag base station" and "An RF tag unit reading unit," respectively. As with the claims of the '632 patent, each of the asserted independent claims of the '019 patent, although using different language to describe the claimed invention, claim similar concepts. As a result, the claim construction issues are related with respect to each claim and can, therefore, be addressed together.

Each of the independent claims, for example, includes a limitation similar to the following from claim 9:

> grouping the RF tags according to a physical characteristic
> of their responsive electromagnetic signals,

This describes how multiple tags are grouped according to a physical characteristic of their responsive signal, where one such characteristic is the signal's modulation frequency. The parties dispute the proper interpretation of this claim limitation.

Two of the claims also include a limitation identical to the following from claim 9: "reading the RF tags in each group," and one, claim 1, includes the limitation "communicating with the tags in each defined group." The "reading" limitations describe how, as discussed above, the tags are successively grouped until the group contains a

single tag and then that tag is read. The "communication" limitation describes how the tags are grouped and then communicated with, where the communication may or may not be the reading of the tag. The parties also dispute the proper interpretation of these claim limitations.

IV. U.S. PATENT NO. 6,371,375

U.S. Patent No. 6,371,375 (the "'375 patent") (Ex. D), which issued on April 16, 2002 from an application filed February 12, 1999, is entitled "Method and Apparatus for Associating Data with a Wireless Memory Device." The '375 patent is directed towards a combination of an RFID tag and a machine readable symbol, such as a bar code symbol, where the data stored in the RFID tag memory is logically associated with the data represented by the bar code symbol. One drawback of using RFID tags to identify items is that when there are multiple items present, it is difficult to directly associate a particular RF signal with a particular item. In other words, the operator may be able to determine that a desired item is within a group of items, but he may not be able to specifically identify that item. By adding a bar code label to the item, the operator can use a bar code reader to specifically locate the desired item.

Claim 1, the only independent claim of the '375 patent, is the only claim of the '375 patent currently being asserted by Intermec. None of the claim terms of this claim appear to be in dispute.

ARGUMENT

I. PRINCIPLES OF CLAIM CONSTRUCTION.

The construction of patent claims is a matter of law exclusively for the Court. *Markman v. Westview Instruments, Inc.*, 52 F. 3d 967, 977-78 (Fed Cir. 1998), *aff'd*, 517 U.S. 370 (1996). On July 12, 2005, the Federal Circuit issued its *en banc* decision in *Phillips v. AWH Corp.*, ____ F.3d ____, 2005 WL 1620331 (Fed. Cir. July 12, 2005) ("*Phillips*") (Ex. E), In Phillips, the Federal Circuit reaffirmed and, where necessary, clarified its prior decisions on claim construction, providing the law underlying many of the basic principles of claim construction. In *Phillips*, the Federal Circuit encouraged district courts to read claims in light of the patent specification while avoiding the temptation to import limitations from the embodiments in the specification into the claims.

In *Phillips*, the Court confirmed the "'bedrock principle' of patent law that 'the claims of a patent define the invention to which the patentee is entitled the right to exclude.'" *Phillips* at *4, *quoting Innova/PureWater, Inc. v. Safari Water Filtration Systems, Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004), and *citing Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996) ("we look to the words of the claims themselves ... to define the scope of the patented invention"); *Markman*, 52 F.3d at 979-81 ("The written description part of the specification itself does not delimit the right to exclude. That is the function and purpose of claims.").[4]

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[4] In *Phillips* the Federal Circuit expressly reaffirmed the claim construction principles outlined in *Markman*, *Vitronics*, and *Innova*. *Phillips* *4.

When interpreting the claims, "the words of a claim 'are generally given their ordinary and customary meaning.'" *Phillips* at *5 (*quoting Vitronics*, 90 F.3d at 1582). The "ordinary meaning" is "the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application." *Phillips* at *5. The Court recognized that "the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification." *Id.*, c*iting, Multiform Desiccants, Inc. v. Medzam, Ltd.*, 133 F.3d 1473, 1477 (Fed. Cir. 1998). For this reason, the Court emphasized that "claims 'must be read in view of the specification, of which they are a part" *Phillips* at *7, *quoting Markman*, 52 F.3d at 979, and that "the specification 'is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term." *Phillips* at *7, *quoting*, *Vitronics*, 90 F.3d at 1582. The Court also reaffirmed the importance of the prosecution history as an additional source of intrinsic evidence to be considered during claim construction but recognized that "because the prosecution history represents an ongoing negotiation between the PTO and the applicant, rather than the final product of that negotiation, it often lacks the clarity of the specification and thus is less useful for claim construction purposes." *Phillips* at *9.

Although emphasizing the importance of the specification to the interpretation of the claims, the Court was careful to recognize "the distinction between using the specification to interpret the meaning of a claim and importing limitations from

the specification into the claim." Thus, the Court repeated its oft-stated warning "against confining the claims" to the preferred embodiments disclosed in the specification. *Phillips* at *15. The Court reasoned, however that:

> [T]he line between construing terms and importing limitations can be discerned with reasonable certainty and predictability if the court's focus remains on understanding how a person of ordinary skill in the art would understand the claim terms . . . . [recognizing that] persons of ordinary skill in the art rarely would confine their definitions of terms to the exact representations depicted in the embodiments.

Phillips at *15.

These principles of claim construction are applied below to support Intermec's proposed construction of the disputed claim terms identified in this case.

II. PROPOSED CLAIM CONSTRUCTIONS

The parties have identified seven disputed issues of claim construction; three with respect to the '222 patent and two each with respect to the '632 and '019 patents. There appear to be no disputed issues of claim construction with respect to the '375 patent. As identified in the parties' joint claim construction chart, for the vast majority of the terms used in the claims at issue, the parties either agree on the proper construction or agree that the terms should be given their ordinary meaning, where that meaning is well understood by those of ordinary skill in the art and not likely to arise as an issue with respect to evaluating either infringement or validity.

A. The '222 Patent

1. "Adjacent Proximity"

As discussed above, the '222 patent is directed at producing a "thin flexible electronic radio frequency tag," where thinness and flexibility of the tag is enhanced by laying out all the components on a single substrate or electrical plane as opposed to multiple substrates stacked one on top of the other. The phrase "adjacent proximity" appears in claim 1 of the '222 patent in the following context:

> c. a circuit chip having a modulator circuit, a logic circuit, a memory circuit, and chip connectors and being on the substrate in **adjacent proximity** to the antenna;

The phrase "adjacent proximity" is defined in the specification and the file history to mean "close (i.e., not stacked)." '222 patent, Col. 4, lns. 22-26 (Ex. A):

> Further novelty of the invention includes arranging the components (chip and antenna and possibly a battery) in adjacent proximity to one another. This means that the components are close (i.e., not stacked).

In the file history the patentee initially put this definition into the claim itself by including the parenthetical "Adjacent means no stacking of elements." (File History Application filed 9/94 at p. 10) (Ex. F).

In light of these affirmative statements by the patentee, the parties appear to agree on the primary interpretation of the phrase "adjacent proximity" to mean "close (i.e., not stacked)."[5] The parties differ, however, with respect to the secondary interpretation of the words used by the patentee to define this phrase. Namely, the parties disagree as to the proper interpretation of the word "stacked."

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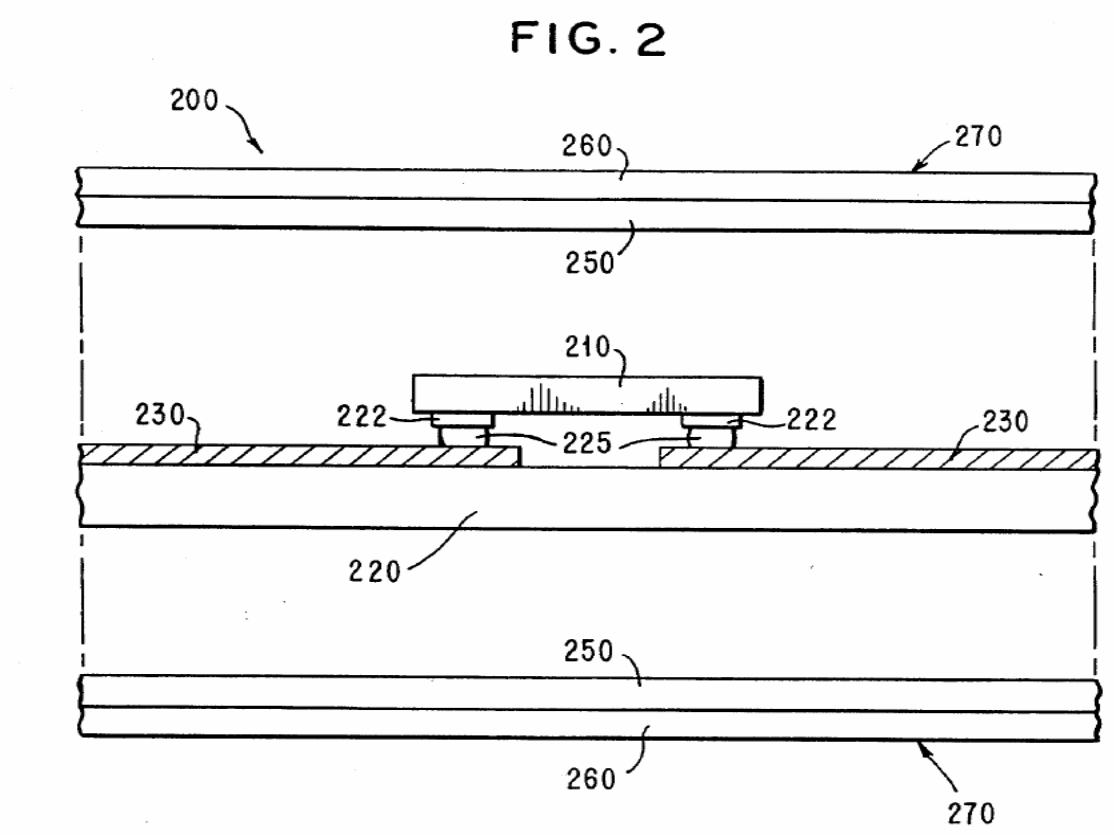
[5] Defendant's construction is essentially the same: "close with no stacking."

The word "stacked," as with the words actually used in the claims, must be interpreted in light of the specification since, as indicated above, "the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the **entire patent**, including the specification." *Phillips* at *5. It is necessary, therefore, to consider the word "stacked" in the context of the patent specification, including the drawings. *Markman*, 52 F.3d at 990.

To illustrate the features of the invention, *i.e.*, a tag where the components are close, but not stacked, the '222 patent included Figure 2, reproduced below:

FIG. 2



The patent specification described Figure 2 as follows:

> FIG. 2 shows a side view of novel RF ID tag 200. The chip 210 is located on a flexible substrate 220. The chip 210 with bumps 225 on contacts 222 is bonded to an antenna 230 contained on the substrate 220.
>
> * * *
>
> Further novelty of the invention includes arranging the components (chip and antenna and possibly a battery) in ***adjacent proximity*** to one another. This means that the components are close (i.e., ***not stacked***). In a more preferred embodiment the closeness is insured because the chip 210 is bonded directly to the antenna 230 without the use of crossover in the circuit . . . . Thus all the wiring is placed in a single plane. Keeping the antenna adjacent to the chip, avoiding cross-overs and stacking, also contributes to keeping the package thin.

('222 patent, Col. 3, 1n. 65 – Col. 4, ln. 35) (Ex. A) (emphasis added).

Thus, the patent specification used the tag of Figure 2 as an example of a tag where the components are "not stacked." Even though the chip 210 in Figure 2 is physically on top of antenna 230, these components are on the same electrical plane and therefore "not stacked," as the term is used in the '222 patent. Intermec's proposed construction of "adjacent proximity" is thus required when the claim is read in light of the patent specification.

Symbol's proposed construction would exclude the preferred embodiment of Figure 2 from Claim 1, the only independent claim of the '222 patent, even though the specification makes clear that that embodiment meets the "adjacent proximity" limitation. "Such an interpretation is rarely, if ever, correct and would require lengthy pervasive enduring support, which is wholly overt in this case." *Vitronics*, 90 F.3d at 1583, cited with approval in *Phillips* at *4.

2. "Connecting Lines"

The phrase "connecting lines" is found in claim 1 of the '222 patent in the following context:

> d. one or more **connecting lines** between the antenna terminals and the chip connectors, the connecting lines being coplanar with the antenna and antenna terminals.

The phrase "connecting lines" is used in this claim in its ordinary sense to describe any substance that connects two or more electrical components. The function of the claimed "connecting lines" is to connect the "circuit chip" to the "antenna" through the "chip connectors" and the "antenna terminals." The patent describes several different ways of making such a connection. The specification, with respect to Figure 2, discusses the use of "bumps" for connecting the chips to the antenna lines, saying that "[t]he bumps 225 then become the connecting lines." ('222 patent, Col. 4, lns. 13-17) (Ex. A).

Figure 7 of the '222 patent refers to different types of bonding available to make connections:

> FIG. 7 shows different types of bonding available in the prior art to attach chips to circuitry that are on the substrate when producing an RF tag. These include thermocompression bonding, ultrasonic single point bonding, soldering, and conductive adhesive.

(*Id.* patent, Col. 6, lns. 1-5). The patent then discusses each of these individual bonding types including, for example, the method shown in Figure 7D related to "conductive adhesive bonding":

> FIG. 7D shows conducting adhesive bonding where a metal-filled adhesive 744 is applied to form the **connecting medium** between chip pads 740 on chip 714 and the substrate pads 724 on the substrate 734. Heat 774 and pressure 784 are applied by pressing between thermodes 764 and 754.

(*Id.*, Col. 6, lns. 28-32) (emphasis added). By expressly identifying these different "connecting medium[s]," the '222 patent makes clear that any of these "connecting medium[s]" (as well as others), can be used as the "connecting lines" called for in the claim.

The proper construction of the phrase "connecting lines" therefore is "any substance that connects two or more electrical components." This includes, by way of example, a substance such as the conductive adhesive disclosed in the specification.

3. "Coplanar"

The phrase "coplanar" is used in claim 1 of the '222 patent in the following context:

> d. one or more connecting lines between the antenna terminals and the chip connectors, the connecting lines being **coplanar** with the antenna and antenna terminals.

As with the phrase "adjacent proximity," the term coplanar is defined in the patent specification and the file history to mean "no vias, crossovers, etc. single plane of wiring," Based on this definition, therefore, "coplanar" refers to components being in the same electrical plane, although not necessarily in the same physical or geometric plane. Although the parties do not necessarily disagree on the primary definition of "coplanar,[6] they appear to disagree on how this definition would be applied to evaluate issues of infringement and validity.

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[6] Symbol has proposed simply that "coplanar" means "single plane of wiring."

Again, as with "adjacent proximity," Figure 2 illustrates a tag in which the "connecting lines" are "coplanar" with the "antenna and antenna terminals."[7] In Figure 2, reproduced above, the "connecting lines" 222 are on top of the antenna terminals. According to the patent, this configuration satisfies the requirement that the "connecting lines" and the "antenna and antenna terminals" be "coplanar" because they are in the same electrical plane, *i.e.*, the "connecting lines" are not on a separate substrate or "dielectric layer" from the "antenna and antenna terminals." If they were, a via or hole through one substrate would be required to enable the "connecting lines" to connect to the antenna terminal. It follows that for two items to be "coplanar" does not mean that they are necessarily in the same physical or geometric plane because, if it did, the "connecting lines" and the "antenna and antenna terminals" of Figure 2 would not be coplanar and the preferred embodiment of Figure 2 would not be covered by the claim. As noted above, "[s]uch an interpretation is rarely, if ever, correct and would require highly persuasive evidentiary support, which is wholly absent in this case." *Vitronics*, 90 F.3d at 1583.

As discussed above with respect to "adjacent proximity," the patent specification emphasizes the importance of having the tag components in the same "plane of wiring" or electrical plane:

> The tag has the antenna and all interconnections placed on a **single plane of wiring** without crossovers.

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[7] The "antenna terminals," while not separately designated in Figure 2 or any figure of the '222 patent, would be that part of the antenna 230 where the antenna connects to the circuit chip via the connecting lines.

('222 patent, Col. 3, lns. 16-18) (Ex. A) (emphasis added).

> The novel design has a **single metal layer** with no vias (between-plane connectors through a dielectric layer) in the flexible continuous film.

(*Id.*, Col. 4, lns. 18-20).

B. The '632 Patent

1. "Backscattered"

The term "backscattered" appears in each of the four asserted claims of the '632 patent. In each instance, it appears in the same general context, such as the following from claim 1 (emphasis added):

> the tag oscillator frequency used to determine a tag modulation frequency of an RF *signal* ***backscattered*** from *the tag antenna*

In the context of the '632 patent specification, the term "backscatter" means "the reflection of incoming RF energy centered about the carrier frequency." This definition is consistent with the general definition provided in the specification when that definition is modified to account for the particulars of the disclosed invention.

Specifically, the background section of the '632 patent specification, defines backscattering as follows:

> The "rebroadcast" or "reflection" of the incoming RF energy at the carrier frequency is conventionally called "back scattering", even though the tag broadcasts the energy in a pattern determined solely by the tag antenna and most of the energy may not be directed "back" to the transmitting antenna.

('632 patent, Col. 1, lns. 46-51) (Ex. B).

As noted above, passive RFID tags receive all of their power from the incoming RF signal, while active RFID tags have their own power source. A passive tag

responds to an incoming RF signal by simply reflecting that signal and, at the same time, modulating the signal with information to be sent to the reader from the tag's memory. *See* '632 patent, Col. 1, lns. 12-45. When speaking of passive tags, therefore, it would be imprecise to say that they "rebroadcast" the RF signal, since "rebroadcasting" implies an active regeneration of the RF signal. The term "reflected" is appropriate because that is what is done with a passive tag. Each of the asserted claims of the '632 patent is specifically limited to passive RFID tags.[8]

Each of the asserted claims of the '632 patent also requires that the "backscattered" signal have a modulation frequency. For example, claim 1, refers to the "**modulation frequency** of an RF signal **backscattered** from the tag antenna." Although the modulation is applied to the RF signal, which is at the carrier frequency, the modulation causes the signal to be distributed about the carrier frequency. *See, for example*, '632 patent, Col. 1, lns. 34-39 (Ex. B) ("the antenna current also oscillates at a harmonic of the carrier frequency because the diode current contains a doubled frequency component.") Therefore, the term "backscattered" allows for modulation of the backscattered RF signal by not requiring the signal to be "at the carrier frequency" but instead to be "centered about the carrier frequency."

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[8] Claims 1 and 28 cover "[A] passive radio frequency (RF) transponder (tag)," claim 13 covers "[a] method of setting a tag oscillation frequency of a tag oscillator of a passive RF tag," and claim 22 claims "at least one passive RF tag for receiving the RF signals."

2. "the tag oscillation frequency determined by the RF signal sent from the base station"

Each of the four asserted claims of the '632 patent includes a similar limitation:

Claim 1 "the tag oscillation frequency determined by the RF signal sent from the base station"

Claim 13: "adjusting the tag oscillation frequency in response to the RF signal from the base station"

Claim 22: "the tag oscillator frequency determined by the Rf [*sic*] signals sent by the base station."

Claim 28: "the tag oscillation frequency determined by the RF signal sent from the base station."

The concept expressed in each of these limitations is simply that a signal sent from the base station is used to determine the oscillation frequency of the tag, thus avoiding the need to have a fixed frequency reference source on the tag itself. The patent exclusively discloses using the modulation frequency component of the RF signal sent from the base station as opposed to, for example, the carrier frequency of the RF signal. As the patent explains, the carrier frequency of the RF signal is significantly different from the modulation frequency. *See* '632 patent, Col. 3, lns. 53-58 (Ex. B) ("The RF frequency f_0 is preferably above 100 MHZ, more preferably above 900 MHZ, and most preferably above 2,300 MHZ. The RF signal is preferably amplitude modulated at a frequency f_1 greater than 1 Khz, more preferably between 5 and 150 kHz, and most preferably between 20 and 60 kHz.") It is important, therefore, to distinguish between the carrier frequency and the modulation frequency when describing how the oscillation frequency is determined.

The '632 patent makes clear throughout its specification that it is the modulation frequency of the incoming RF signal, not the carrier signal, that is used. For instance, the title of the patent is:

> Single chip RF tag oscillator circuit synchronized by base station **modulation frequency**

('632 patent, Col. 1, lns. 1-3) (Ex. B) (emphasis added). Similarly:

> The preferred signal is the **modulation frequency** of the modulated RF signal that the base station sends to the tag.

(*Id.*, Col. 1, lns. 12-14) (emphasis added);

> The oscillator 100 frequency is thus determined by the **modulation frequency** of the RF energy 20 transmitted by the base station 10.

(*Id.*, Col. 5, lns. 2-4) (emphasis added). *See also*, Fig. 8 (820).

Under the rule of the *Phillips* case, it is clear that the repeated and exclusive references in the '632 patent specifications to the "modulation frequency" of the signal sent by the base station did more than provide an example of the claimed invention, it demonstrated the patentees' intent to define their invention as using the "modulation frequency" as opposed to the carrier frequency of the signal sent from the base station. *Alloc, Inc. v. Int'l Trade Comm'n*, 342 F.3d 1361, 1369-70 (Fed. Cir. 2003), *cert. denied*, 541 U.S. 1063 (2004) (construing claim to include limitation because "very character of the invention" required that the limitation be part of every embodiment); *Bell Atl. Network Servs., Inc. v. Covad Communications Group, Inc.*, 262 F.3d 1258 (Fed. Cir. 2001) (construing claim to reflect inventor's consistent usage of claim term in specification); *Phillips* at *8.

Furthermore, the invention as disclosed in the '632 patent would not function if the carrier frequency were used. *Microsoft Corp. v. Multi-Tech Sys., Inc.*, 357 F.3d 1340, 1351-52 (Fed. Cir.), *cert. denied*, 125 S. Ct. 61 (2004) (construing claim to

require feature that was "central to the functioning of the claimed invention[ ]"). The claims themselves require that the "tag oscillator" be "connected to the receiver section." '632 patent, Col. 9, ln. 63; Col. 12, lns. 2-3; Col. 12, ln. 36; *see also*, Fig. 2 (Ex. B). The receiver section "demodulates the RF signal and delivers a digital signal to the rest of the tag electronics over line 62," including to the Tag Clock Section. *Id.*, Col. 4, lns. 23-24; Fig. 2. "The tag clock section 40 receives the digital demodulated digital signal from line 62 and sets the tag oscillator frequency using the modulation frequency f_1 of the modulated RF signal . . . ." *Id.*, Col. 4, lns. 32-35. As explained in much of the remainder of the specification, it is the demodulated digital signal derived from the *modulation frequency* of the RF signal from the base station that is used to determine the tag oscillation frequency. *Id.*, Col. 4, ln. 55-Col. 5, ln. 50; Col. 7, ln. 63-Col. 9, ln. 45; Figs. 3, 4, 8 and 9. No such demodulated digital signal could be derived from the carrier frequency of the RF signal and without that demodulated signal, the remainder of the invention as disclosed and claimed could not function.

In each of the four asserted claims of the '632 patent, therefore, the tag oscillation frequency is determined by the *modulation frequency* of the RF signal sent from the base station.

C. The ‘019 Patent

1. “defining a plurality of RF tags into different groups according to a physical wave characteristic of the electromagnetic wave energy received from the RF tags”

Each of the three asserted independent claims of the ‘019 patent includes a similar limitation:

Claim 1 “defining a plurality of RF tags into different groups according to a physical wave characteristic of the electromagnetic wave energy received from the RF tags”

Claim 9: “grouping the RF tags according to a physical characteristic of their responsive electromagnetic signals”

Claim 18: “grouping the RF tags according to a physical characteristic of their responsive electromagnetic signals”

The concept expressed in each of these limitations is simply that a plurality of tags will be grouped according to a physical characteristic of the electromagnetic wave received by the base station from the tag. The terms in this claim element should be given their ordinary meaning. *Phillips* at *5. The only clarification that might be required is to determine whether the “physical wave characteristics” covered by the claims are limited in any way. Based on the specification and file history, they are not.

The ‘019 patent specification makes clear that virtually any physical characteristic of the tag’s responsive electromagnetic wave is within the scope of the claim:

The most preferred embodiment of the invention is the method of selecting groups on the basis of the physical signal strength of the RF signal received from the tags by

> the base station. . . . The base station may also select groups of tags according to the polarization or the phase of the returned RF signal, the RF carrier or Doppler shifted RF carrier or modulation frequency sent by the tags, **or any another physical signal from the tags**.

('019 patent, Col. 3, lns. 3-14) (Ex. C) (emphasis added).

These claim limitations, therefore, should be construed to have their ordinary meaning where the phrase "physical wave characteristic" or "physical characteristic" is not limited to any particular wave characteristic.

2. "communicating with the tags in each defined group" or "reading the RF tags in each group."

Each of the three asserted independent claims of the '019 patent includes a similar limitation:

Claim 1: "communicating with the tags in each defined group."

Claim 9: "reading the RF tags in each group."

Claim 18: "reading the RF tags in each group."

The terms in these claim limitations should be given their ordinary meaning.

> We have frequently stated that the words of a claim "are generally given their ordinary and customary meaning." *Vitronics*, 90 F.3d at 1582 . . . . [which] is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention . . . . Importantly, the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification."

Phillips at *5.

The limitations of claims 9 and 18, as would be understood by one of ordinary skill in the art in the context of the patent, require that the base station "read" the tags in each group, where the reading proceeds one tag at a time since, as the patent explains, an RFID reader can only read one tag at a time ('019 patent, Col. 2, lns. 47-53) (Ex. C). As discussed above, the '019 patent discloses a communication protocol that enables multiple tags to be read one at a time by grouping the tags based on a physical wave characteristic of the signal received from the tag. The tags, therefore, are successively grouped until the group contains only one tag. The reader then reads that tag and starts the process over to read the remaining tags.

The concept expressed in claim 1, however, is somewhat broader. Claim 1 requires only the step of "communicating" with the tags in each group and does not require that the tags in each group be read. The patent distinguishes between "reading" a tag and "communicating" with a tag. For example, the patent consistently uses the term "read" in the context of obtaining the data from the tag memory to identify the tag:

> If the base station can **read** a tag unimpeded by signals from other tags, the base station interrupts the interrogation signal, and the tag which is sending and has been **identified** shuts down. The process continues until all tags in the field have been **identified**.

('019 patent, Col. 2, lns. 15-18) (Ex. C) (emphasis added):

> If a single tag is in the field, and can be **read** at step 570, the single tag is **read** and instructed to shut off . . . If more than one tag is in the field and the tag signals interfere with each other so that they can not be **read** at step 570, a multiple tag **reading** protocol is instituted in order to **read** the multiple tags at step 580. The tags are **read** using the multiple tag **reading** protocol, and ordered to shut down.

(*id.*, Col. 7, lns. 49-57) (emphasis added). *See also* Figs. 5-9; Col. 8, ln. 50 – Col. 9, ln. 11; Col. 9, ln. 66 – Col. 10, ln. 13.

By contrast, the term "communicating" is used more broadly to describe any transmission of information between the base station and the tag. This information could include commands to the tag as well as responses from the tag which might include, but need not include, the tag identification information. For example, the patent describes the communication protocol disclosed in related patent applications incorporated into the '019 patent specification as follows:

> a base station **communicates** to a plurality of tags by polling the tags and shutting down tags in turn until there is just one left The information is then exchanged between the base station and the one tag, and then the one tag is turned off. The unidentified tags are then turned on, and the process is repeated until all the tags have the communication protocol completed.

('019 patent, Col. 2, lns. 47-53) (Ex. C). The reader, therefore, communicates with the tags as part of the communication protocol that groups the tags prior to the tags being read and then communicates with the tags to read the tags. "Communicating" with the tags, therefore, is broader than "reading" the tags.

CONCLUSION

For the reasons stated, the disputed terms of the patents-in-suit should be construed as set forth herein.

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CERTIFICATE OF SERVICE

I, Jack B. Blumenfeld, hereby certify that on July 25, 2005 I electronically filed **Plaintiff's Opening Claim Construction Brief** with the Clerk of the Court using CM/ECF, which will send notification of such filing to the following:

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